

Name: _____ Date: _____
Algebra 2/Trig: Sum and Difference Formulas

DO NOW: (Review)

If $\sin \theta = -\frac{5}{13}$ and θ resides in quadrant III, find $\sin \theta \cos \theta$.

Please give all answers as **exact values in simplest form**.

A] $\sin(A + B)$

$$\sin(A + B) = \sin A \cos B + \cos A \sin B$$

1) Find the exact value of $\sin(75^\circ)$

2) If $\sin A = \frac{4}{5}$, $\cos B = \frac{12}{13}$, and A and B are measures of angles in quadrant I, find $\sin(A + B)$.

B] $\cos(A + B)$

$$\cos(A + B) = \cos A \cos B - \sin A \sin B$$

3) If $\sin A = \frac{3}{5}$ and A is in Quadrant I, $\cos B = -\frac{5}{13}$ and B is in Quadrant II, find $\cos(A + B)$.

C] $\tan(A + B)$

$$\tan(A + B) = \frac{\tan A + \tan B}{1 - \tan A \tan B}$$

4) If $\sin A = \frac{3}{5}$, $\cos B = \frac{5}{13}$, and A and B are measures of angles in quadrant I, find $\tan(A + B)$.

5) Verify that $\cos(\pi + x) = -\cos x$ using an identity.

D] $\sin(A - B)$, $\cos(A - B)$, and $\tan(A - B)$

Today we learned how to use the **trig sum angle formulas**.

The **trig difference angle formulas** are the same, with opposite signs!

$$\sin(A + B) = \sin A \cos B + \cos A \sin B$$

$$\cos(A + B) = \cos A \cos B - \sin A \sin B$$

$$\sin(A - B) = \sin A \cos B - \cos A \sin B$$

$$\cos(A - B) = \cos A \cos B + \sin A \sin B$$

$$\tan(A + B) = \frac{\tan A + \tan B}{1 - \tan A \tan B}$$

$$\tan(A - B) = \frac{\tan A - \tan B}{1 + \tan A \tan B}$$

You can do this! I believe in you. ☺

If you have taken good notes, these practice problems will be a breeze!

6) Evaluate $\tan(60^\circ + 30^\circ)$ using the formula for $\tan(A + B)$.

7) If $\sin A = \frac{4}{5}$, $\cos B = \frac{8}{17}$, and A and B are measures of angles in quadrant I, find $\sin(A - B)$.
(Look back at #3)

8) If $\sin A = \frac{5}{13}$ and A is in Quadrant I, $\cos B = -\frac{4}{5}$ and B is in Quadrant III, find $\cos(A - B)$.
(Look back at #5)

9) Verify that $\tan(180^\circ - x) = -\tan x$ using an identity. (Look back at #8)